BETTER FRUIT

VOLUME XV — AUGUST, 1920 — NUMBER 2

TYPICAL SCENE IN AN OREGON FRUIT GROWING DISTRICT

This view which shows Mt. McLoughlin from a point near Medford combines the beautiful and the utilitarian, for it is from these snow capped mountains that many of the fruit growing sections of Oregon secure irrigation.

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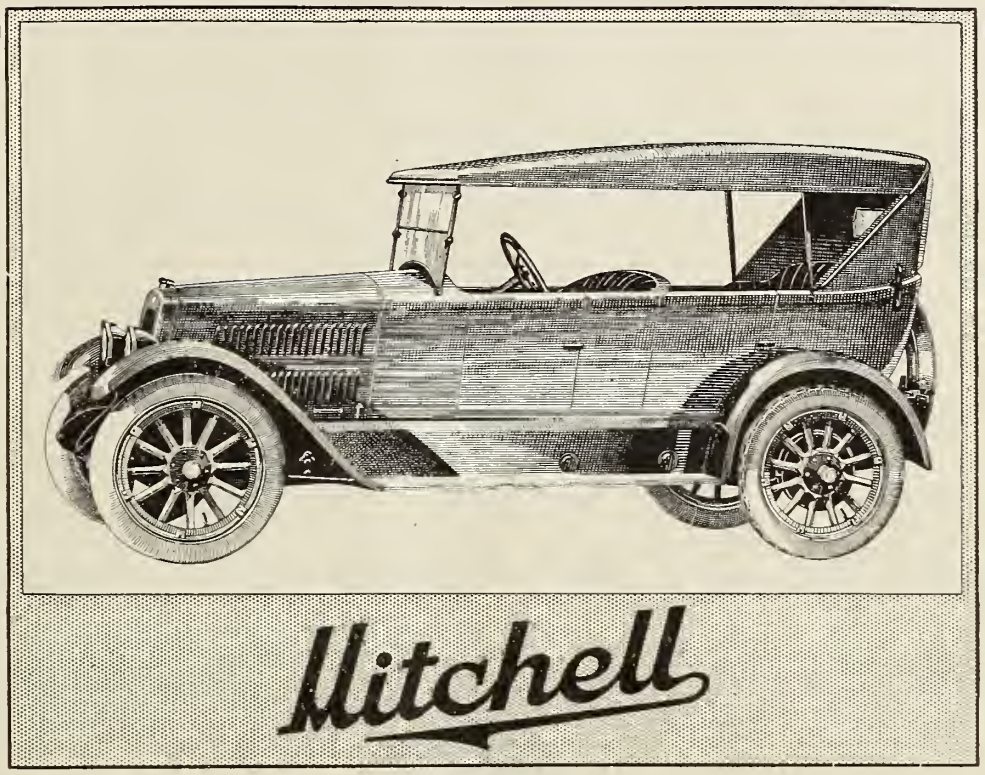

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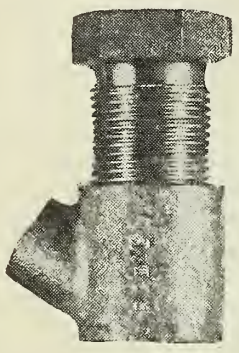

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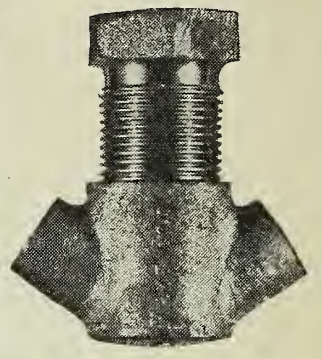

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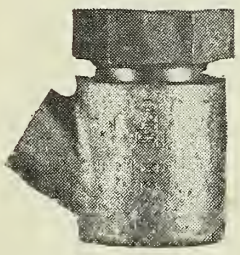

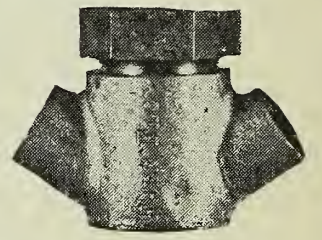

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A New and Successful Type of Fruit Evaporator

By W. V. Cruess

IN a recent article, A. W. Christie has given a resumè of the fruit drying situation as it exists in California and has referred to the great interest of fruit growers in this state in evaporations of fruits, in spite of the fact that the reputation of California's dried fruits is based upon the sun dried article. Loss of fruit on sun drying trays from early rains has been the most important factor in causing California fruit growers to doubt the good old sun drying methods; accessory considerations have been the superior quality of the artificially dried product, economy of land for the evaporator as compared to the space required for sun trays and the fact that evaporated fruit is less exposed to contamination by dust, etc., during drying.

Types of Evaporators:..There are numerous styles of evaporators before the would-be-purchaser. He is apt to become bewildered when he meets the enthusiastic salesmen of the various forms of driers and may often succumb to the persuasive arguments of the most fluent agent, who unfortunately usually represents the least satisfactory machine. Thus disappointment often results, and worse than disappointment comes financial loss and waste of at least a season's time. The manufacture of commercially built driers is in a decidedly experimental state—practically none are perfected. This statement is made after a thorough investigation of the many types on the market.

Of the existing commercial machines those designed to dry the fruit upon trays by a horizonal air blast are most successful. However, many of these are far from satisfactory.

The kiln, stack, and Oregon tunnel forms of patented commercial driers are in most cases no better than the tried and true home-made driers of the same types. The Oregon Tunnel as used in Oregon and Washington, is a machine perfected by long use by practical men and is an evaporator of much merit.

How to Select an Evaporator: There are only two ways to select a drier, one, to build a drier fully tested, recommended and described in Government or state publications; the second, to see in operation over a period of at least forty-eight hours the drier that is under consideration for purchase or erection. During this test be certain that the drier is loaded to capacity. Accept no excuses for poor performance. The machine should be operated economically in regard to fuel and labor; should dry the fruit evenly; should not scorch the fruit; and should dry the product in a reasonable time under a full load. Never has the adage "buy in haste and repent in sorrow" been more aptly illustrated than in the purchase of evaporators.

The writer desires to present in the remainder of this article plans and specifications for a successful evaporator built and operated for experimental purposes by the University of California. The plant holds six tons of grapes or prunes per charge—a convenient size for the average grower, and will dry six to ten green tons of fruit per 24 hours. The complete plant cost in 1919 about $3,500.

The specifications follow. The general appearance of the plant is shown in the sketches and accompanying photographs.

Furnace Room.—1. Of reinforced concrete 6-inch walls. Floor of gravel.

2. Length 14 feet, width 8 feet, height 11 feet, inside dimensions.

3. One end with opening 8 feet 2 inches high and 6 feet 6 inches wide to connect to drying tunnel and to provide entrance to furnace room.

4. Opposite end fitted with two openings 20x15 inches wide, 15 inches from the ground level and 3 inches from side walls. One door 20 inches high and 15 inches wide in center wall at 5 feet from ground level. All openings fitted with vertically sliding and adjustable doors. One plain opening midway between side walls 12x12 inches and with center of opening 18 inches from ground level, for insertion of burner.

5. Side walls solid. Roof solid, except for circular smokestack opening 13 inches in diameter in roof 1 foot from end of furnace room opposite tunnel.

6. Furnace to consist of an old boiler shell, approximately 10 feet long and 3 feet in diameter, with tubes removed; with one head removed and opposite head fitted to receive 12-inch pipe. Where wood or coal is used as fuel a somewhat larger furnace and grate should be installed.

7. Air heating pipes to consist of three tiers of 12-inch heavy sheet metal black iron pipe above furnace. Nine pieces 10 feet long, one piece 12 inches long to connect to furnace; one three-way connection to connect to furnace outlet pipe; one three-way connection at stack; four elbows, six return bends; one T in stack with one opening into furnace room with damper, and stacks 20 feet long and fitted with adjustable damper in furnace room. By means of these two dampers gases of combustion may be allowed to flow into furnace room for direct use in drying, thus doubling efficiency of fuel, or the furnace gases may be allowed to escape through the stack.

8. Furnace to be fitted with a medium size air blast stove distillate burner or crude oil burner, air blast type. Latter system would require separate air compressor and motor.

9. Fuel tank. Covered circular sheet metal tank, about 4 feet in diameter and 5 feet high. Connected by ¼-inch pipes to burners at furnace room and dipping vat.

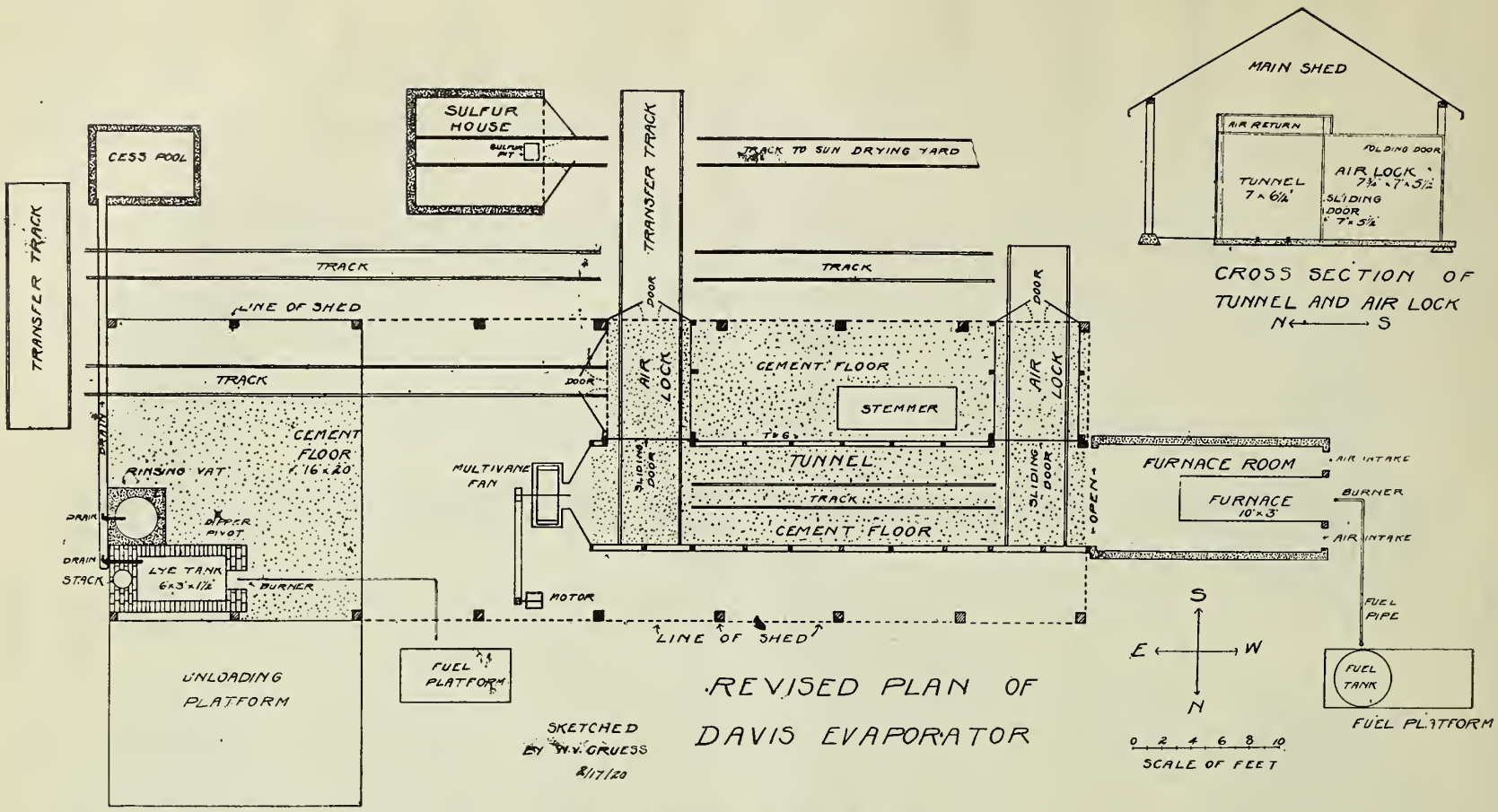
Drying Tunnel.—1. Length inside 33 feet; height from tunnel tracks to ceiling, 7 feet; width 6½ feet inside.

2. Frame of 2x4-inch S-2-E placed 2 feet on centers.

3. Walls, 1x4-inch T. & G. pine flooring on both sides of the 2x4-inch frame. Ceiling, one thickness T. & G. flooring.

4. Floor of tunnel of surfaced concrete. Areas 64 inches wide at each end of tunnel opposite doors are made sufficiently lower than general tunnel floor level to permit transfer of

General appearance of evaporator.



University evaporator, revised ground plan.

tunnel cars to transfer car, and vice versa. Depth about 2 inches.

5. Tunnel floor and ceiling slope ¼ inch per foot from fan toward furnace end of tunnel to facilitate moving loaded cars forward.

6. One side sliding door at side of tunnel 10 inches from fan end and a similar door at side of tunnel 6 inches from end of tunnel. Doors to be 7 feet 1 inch high and 6½ feet wide and of double thickness T. & G. flooring.

7. Air return flue 6½ feet wide by 1 foot high and 33 feet long above tunnel. Ceiling of tunnel forms floor of this flue. Walls and ceiling of fluc of T. & G. flooring over 2x4 S-2-S Oregon pine. Fan end of fluc connected to air outlet of top vertical discharge fan by sheet metal housing fitted with adjustable sliding door. Opposite or furnace end fitted with adjustable folding door.

8. Fan. Outlet end of tunnel connected to a stop vertical discharge multivane exhaust fan of such size that its catalog rating is about 18,000 cubic feet of air at 300 r.p.m. and ½-inch static pressure, corresponds to a No. 6 Sirocco fan or No. 9 Sturtevant multivane exhaust fan.

9. Motor. A 7½-h.p. motor or engine is needed to operate the fan, which should be fitted with such size pulley as to give about 300 r.p.m. to fan. A 23-inch pulley on fan and 6-inch pulley on a motor operating at 1180 r.p.m. will give about the desired speed.

10. Tracks. Transfer tracks through each tunnel door of 8 pounds per yard dry yard rails set in concrete on 4x4-inch ties. Rails 42 inches apart. One set 20 feet long and other set 31 feet long, latter connecting with sulphur house. Tracks in tunnel extending between the two sets of transfer tracks of 8 pounds per yard rails set 24 inches apart inside in concrete on 4x4-inch ties and are 27 inches from walls inside of rails. Rails extend to edge of transfer car pits at each end of tunnel and are 20 feet 10 inches long. One set of tracks 24 inches apart and 20 feet 10 inches long, 3 feet 6 inches (on center) from outer line of shed, placed parallel to tunnel and connecting with the two transfer tracks which connect through tunnel doors. This track to be continued beyond the sulphur house transfer track 2 feet beyond end of shed housing the dipping outfit, and connecting with a transfer track 17 feet long by which cars may be transferred from track outside shed to track beside dipper under shed. Connecting dipping outfit and air lock at fan end of tunnel is a 24-inch track 35 feet 6 inches long. This track permits loaded cars to be taken to tunnel or sulphur house via air lock and sulphur house transfer track.

11. Air Locks. A compartment 5½ feet wide, 7¾ feet long and 7 feet high, connecting to door at fan end of tunnel. Side toward dipper to consist of two folding doors, each 3¼ feet wide by 7 feet high, inside measurements. The side toward sulphur house to be formed by two folding doors each 2 feet 10 inches wide. Walls and ceiling of T. & G. flooring over 2x4-inch pine. A similar compartment at door at furnace end of tunnel, but this to be fitted with two folding doors 2 feet 10 inches by 7 feet at end and no doors at side. Compartments are used to permit entrance and removal of cars without admission of cold air to tunnel.

12. Trucks. Twelve ordinary dry yard trucks as used in Fresno County of wooden frame and built to run on 24-inch tracks. Frames 6 fect long to be removed and placed at right angles to usual position so that in the tunnel the frame will extend across the tunnel. Frame to be extended two inches on either side, making total width of frame 6 feet 4 inches. This permits 1 inch clearance on either side in tunnel. A frame of 2x4-inch material 6½ inches high to be built up in center of car to act as guide for stacking trays. Four level steel transfer cars, Fresno County pattern, for 42-inch tracks.

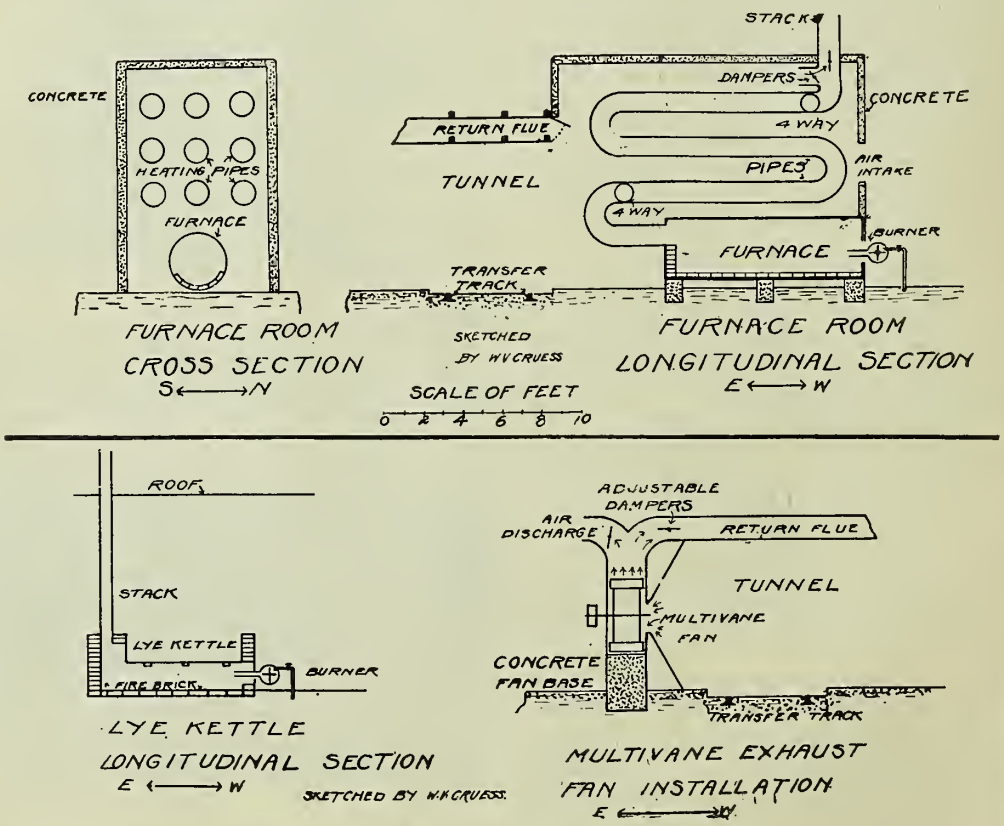
13. Observation Windows. Five 12x12-inch portholes in wall of tunnel, 3 feet from floor and closed with air-tight doors. Portholes to be so placed that cars of fruit in tunnel may be easily observed during drying.

Shed.—1. Shed 64 feet long by 20 feet wide, 8 feet high at eaves. Shingled roof, quarter slope. Roof resting on 6x6-inch stringers on 8x8-inch redwood supports, 8 feet 6 inches long, on concrete piers 8 fcet on centers. Sides and ends of shed open. Shed so placed that tunnel wall containing air locks is 8 feet from outside line of shed and other wall 5 feet from line of shed. Shed to house tunnel and dipping outfit, but not furnace room or sulphur house. Ventilator over dipping outfit 10 feet long and 3 feet high, with roof of same slope as shed roof.

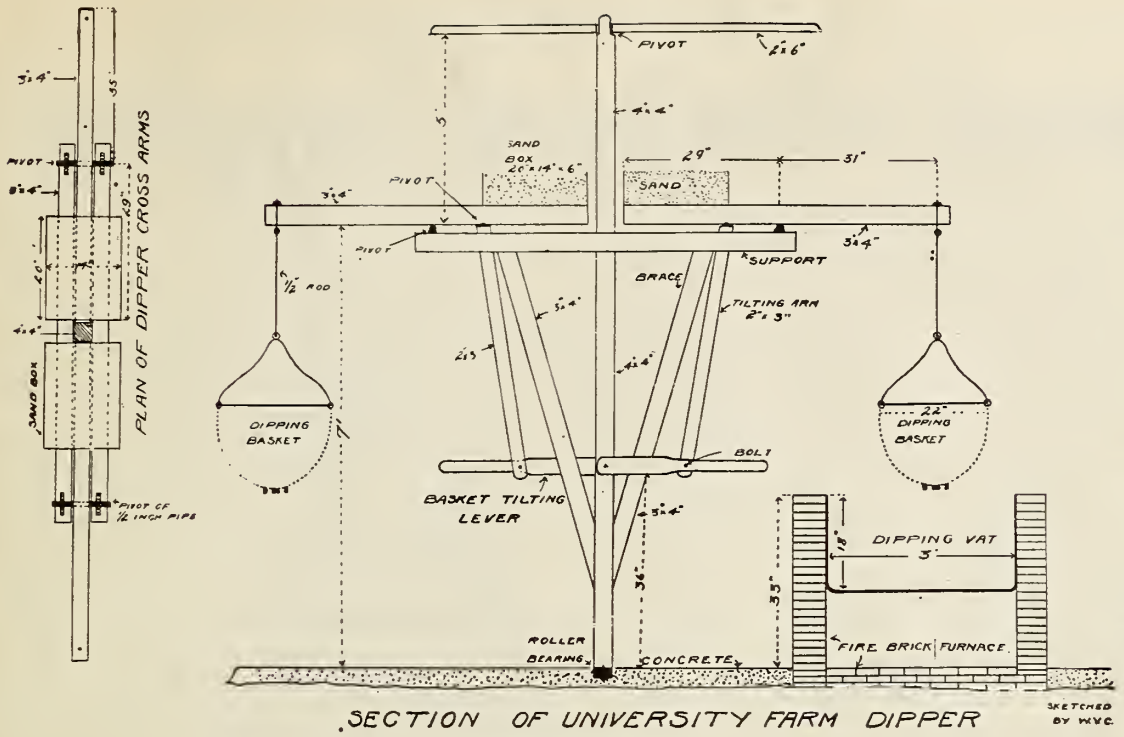
2. Shed floor 4-inch concrete, surfaced.

Dipping Outfit (for Prunes or Grapes).

1. Dipping Tank. Heavy black sheet iron tank 6 feet long by 3 feet wide and 1½ feet deep, set in firebrick furnace fitted with medium size forced blast oil or distillatc burner or larger gravity distillate burner. Top of tank 33 inches from floor. Outer wall



Section of more important jarts of evaporator.



Dipping machine.

of furnace on line of outer shed and one on end line of shed. Fans to be fitted with 1½-inch drain.

2. Rinsing Vat. Same size and construction as dipping vat, but placed on cement piers. Fitted with 1½-inch drain. Vat placed on path of dipping basket and adjacent to dipping vat.

3. Water supply to fill vats and wash floors.

4. Dipping machine of merry-go-round type. Appearance of this machine best seen from sketch.

Alternative Dipping Arrangement.—One commercially built hand-power prune dipper equipped with rinsing vat and oil or distillate burner in addition to dipping tank. This equipment has proved thoroughly satisfactory, but the distillate burner is essential.

Sulphur House.—Of concrete, brick or wood, and placed beside transfer track connecting to air lock and tunnel at fan end of tunnel. Placed 8 feet from outer line of shed. Size, 8½ feet long by 7½ feet high by 7 feet wide inside. End towards transfer track formed by two folding doors, each 3½ feet wide by 7½ feet high. Small sulphur pit 8 inches square by 6 inches deep in floor between tracks near door. Tracks 24 inches apart, extending to rear end of sulphur house and transfer track. Adjustable vent 6 inches square in roof. Sulphur house may be omitted; not absolutely essential.

Cesspools and Drains.—If evaporator is not connected to sewer system a cesspool at least 8 feet by 6 feet by 8 feet deep will be needed to care for waste water, or waste waters may be run on land, but may in time impregnate the soil with injurious amounts of alkali.

Stemmer.—One ordinary raisin stemmer and 3-h.p. motor. Not absolutely essential, but desirable for dried wine grapes.

Receiving Platform.—At side of shed holding dipping outfit. Length 16 feet, width 12 feet, height 2 feet. Made of 2x12 rough pine and —x— frame on concrete piers.

Trays. — Five hundred trays, slat-bottom type, 3x3 feet in size. Sides—Each side made up of one piece 36x2x1½-inch and one piece 33x1x1½-inch. Ends—Each end made up of one piece 36x1x1½-inch. Bottoms—Made up of ¼x½-inch strips 36 inches long, placed ⅜ inch apart, 40 strips to each tray. One brace ½x1x33 inches extending under middle of tray.

Approximate List of Materials.—1. Lumber for construction of shed and tunnel: 6x6-inch rough redwood, 18-foot lengths, 162 linear feet; 2x6-inch S-2-E Oregon pine, 950 linear feet; 1x6-inch pine sheathing, 3500 linear feet; 2x4-inch S-2-E Oregon pine, 400 linear feet; 1x4-inch T. & G. flooring, 8000 linear feet; 2x8-inch rough pine, 82 linear feet; 4x6-inch rough pine, 88 linear feet; 4x4-inch rough pine, 64 linear feet; 4x4-inch S-4-S Oregon pine for dipper, 10 linear feet; 3x4-inch S-4-S Oregon pine for dipper, 20 linear feet; 2x12-inch rough pine, 300 linear feet; 19,000 redwood shingles. Total cost in 1919, $679.99.

2. Shook for trays: 1000 pieces 36x2x1½-inch sugar pine S-2-E; 1000 pieces 33x1x1½-inch sugar pine S-2-S; 1000 pieces 36x1x1½-inch sugar pine S-2-S; 20,000 pieces ½x¼-inch sugar pine S-1-S; 500 pieces 33x½x1 inch. Cost in 1919, $90.

3. Motor or engine, 7½ h.p.

4. Boiler shell with tubes removed, one head removed, and one end fitted to receive 12-inch stack. Size 10 or 12 feet by 36 or 40 inches.

5. Burners. Two medium size air blast oil or distillate burners, or three large ditto, gravity type.

6. Fan. One multivane top vertical discharge exhaust fan with blade wheel 36 inches in diameter through axle (e.g., No. 6 Sirocco or No. 9 Sturtevant).

7. Two tanks for dipper, each 6x3 feet by 1½ inches, heavy gauge black sheet metal.

8. Two 22-inch prune dipping baskets.

9. One set roller bearings for dipper (or items 7, 8 and 9 to be replaced by one hand-power prune dipper and rinser).

10. Dry yard rails, 8 lbs. per yard, 400 feet.

11. Black sheet iron heavy gauge 12-inch pipe: Nine lengths 10 feet long; one length 1 foot long; two 3-way connections; four elbows; six return bends; one T fitted with damper; one 20-foot length for stack.

12. About 500 plain bricks and about 500 firebricks for dipping outfit and furnace.

13. About 130 sacks cement for furnace room, floors and sulphur house.

14. About 150 lbs fireclay for furnaces.

15. Three loads crushed rock, four loads sand, 17 loads creek gravel, 1½ barrels lime (used at University Farm 1919).

16. One recording thermometer, range about 50 degrees F. to 220 degrees F.

17. Leather belt 20 feet long, 4 inches wide, 2-ply.

18. Miscellaneous: Nails, water pipe, hose, hinges, roller and trucks for sliding doors, wiring, etc.

A number of these evaporators are being built in California by growers who have been impressed with its performance during the past year. It is suitable for all varieties of fruit.

Cover Crops, Tillage and Commercial Fertilizers

By H. Thornber, Superintendent Horticultural Substation, Corvallis, Oregon

YEARS ago it was discovered that the moisture in the soil could e conserved by keeping the surface tilled and preventing the growth of weeds. Later when orchards were planted in regions where the rainfall was not always sufficient to mature the crop the practice of cultivating the soil to conserve the moisture was commenced. The results were satisfactory for a few years, but various difficulties were encountered later which threatened to destroy many profitable orchards unless the conditions were remedied. The soil commenced to bake, the surface to wash, and finally the trees began to fail. The soil specialists were consulted and they explained that the fault was in the system which was removing the supply of plant food and humus without allowing anything to be returned. To remedy this condition crops of various kinds were sown and plowed under. Soon the conditions of the soil improved and the trees resumed their normal growth and production. Later this system of orchard tillage became known as the cover-crop method of orchard cultivation, and is today recognized as an ideal if not the ideal method of orchard cultivation.

Correctly speaking, a cover-crop is some farm crop sown about mid-summer and either plowed under in the late fall or allowed to remain until spring when it may be plowed under before or after it has made growth. However, in the broad sense, a cover-crop may be considered as any crop grown in the orchard for the purpose of plowing under as a green manure.

Cover-crops may be divided into several classes. For our purpose we may consider them as leguminous and non-leguminous according to their food storing habits. To the first group belong the clovers, peas, vetches, etc., which gather nitrogen from the air and store it on their roots, while the second group consists of those common grains and even weeds which produce only humus when plowed under. From each of these groups single crops or combinations may be selected which will be suitable to any district or local conditions.

At this point it might well to review a few of the benefits derived from the use of cover-rops. (1) Cover-crops directly improve the physical condition of the soil and subsoil. (2) Organic matter is like at patent medicine—it is good for whatever ails the soil, but unlike a patent medicine it cannot injure any soil. (3) They help hold the snows and rains and prevent the leaves from being blown out of the orchard. (4) They serve as a protection to the tree roots from frost. (5) They use up the soluble plant food in the fall and hence prevent its loss through drainage. (6) They render plant food available by their growth and root action. (7) They make cultivation and irrigation easier and more effective. (8) Leguminous cover-crops actually add nitrogen to the soil. (9) They cause early ripening of the trees which in turn prevents winter injury. (10) They prevent erosion on steep orchard lands.

Continued on page 20.

Bookkeeping for the Orchardist

By E. R. Sanford, Head Department of Business Training, Missoula County, Montana, High School

THE experience of the majority of people who have attempted to keep farm and orchard records has not been satisfactory for several reasons, chiefly because at a busy season the records have been neglected. The person waits for a rainy day for writing up the records and the rainy days in Montana have been so few and at such long intervals that a great portion of the facts to be recorded have been forgotten. The effort is made, the results are disgusting and the book is slammed into a corner, there to remain until after the harvest. When the leisure days of winter come, you begin to speculate upon just what your year's labor has netted you, or your income tax return blank arrives to be filled in (if you are so fortunate as to have an income from an orchard which will permit you to make a return), so you dig out the old book and try again, with more or less unsatisfactory conclusions and rather poor guesses as to real conditions of your affairs.

Failure often results from attempting a too complicated system, in which the labor of working out the details is too great for the results secured, and I shall endeavor to give you some few points to help you establish your accounting system.

First, it is necessary to know what results you want to secure, and then shape and arrange your system to fit your case. Don't buy an elaborate system and then try to live up to it and shape your career to fit the system. I will try to illustrate this point a little later.

There are some steps which are necessary before you start your accounts, first of which is a complete inventory of your orchard and equipment at a fair valuation. This is your foundation. In fact, it is possible to arrive approximately at your condition by careful annual inventories with comparative analyses. Inventories once set up, it is not a difficult problem to determine what your depreciation may be from use. To illustrate, assume that you have a disc valued at $50, which under usual conditions, would last ten years, then for inventory value it will depreciate 10 per cent on original value each year for ten years, that is, $45, value second year $40, third, etc.

The time to take the inventory is whenever most convenient, but it should be at practically the same date each year. Some people prefer the first of the year, others about March first, just before spring work begins. Your land and permanent improvements, including buildings and trees, should be included as real estate, but the costs of upkeep and operation must be kept separately.

Once you have determined your inventories and listed them in an inventory book or schedule, the next item is the cash account. The best method for handling the cash is to deposit with your bank and pay all bills by check, of course, because you then have a voucher for each payment, but it is not always convenient for the orchardist who lives some distance from the bank to handle it in this way. However, you must form the habit of recording all items of cash received or paid out every day, say at the supper hour, or other regular time. The book in which the cash record is kept may be easily classified and arranged so as to reduce the work of making the records and at the same time secure the results desired, with no transfers to other books, this being your permanent and classified record. This is known as the columnar method, which is a cash book with any number of columns, classified by titles at the top of the various columns which makes distribution easy, and the totals of the columns at any time will show total cash costs for the various classifications by months, years, days, or any manner desired.

To make this more concrete I desire to show you some ruled sheets of a cash book showing how results are secured. I want the cost of prunning, spraying,

Receipts		Payments	Prune	Spray	Cultivating Irrigating	Repairs Upkeep	Boxes	Picking Packing	Delivering	Miscel. Taxes Insurance
Apples	1500–	2 men 4 day	30							
		3 times 3 day		42.40	119.12	45.41				
		1000 boxes					159.60			
		Picking						90.00		
		Packing						60.55		
		Hauling							77.55	21.63
		Totals	30	42.40	119.12	45.41	159.60	150.55	77.55	21.63
		Grand Totals								646.26
		Balance								953.74
	1600–									1600.00

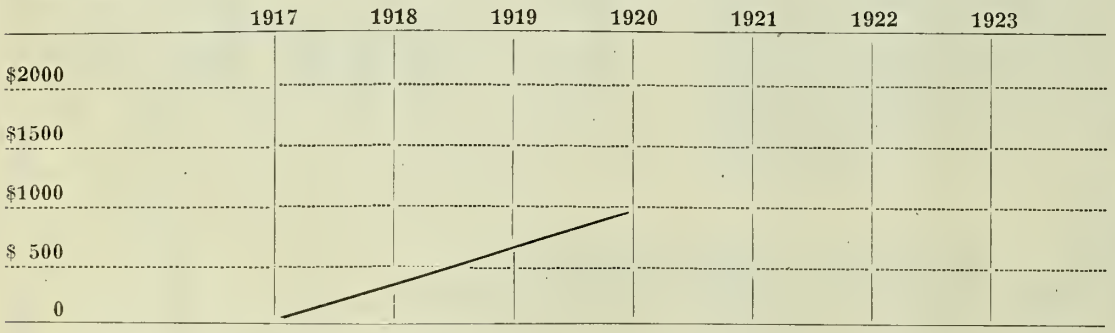
cultivating and irrigating, implements and upkeep, boxes, picking and packing, delivery. Miscellaneous (such as taxes, insurance and overhead). The wide left hand space is for receipts, the right side is for payments.

Special columns might be added for team feed and upkeep, or tractor, oil and gasoline. The method is sufficiently flexible to allow for any results one may desire. This anticipates a cash business.

Should there be transactions which cannot be turned at once into cash, and with most of us there will be such transactions, then provision must be made for recording the items. The simplest form I can recommend to keep these records will be a sheet or book which we may call the "charge," or customer's, record, where the customer's name will appear for the articles charged to him. This will require another record to group the various charges to each individual under one heading.

A credit, or purchase sheet may be used with the same rulings as the cash sheet where the name of the party is entered and the items of cost distributed to their respective columns. The totals of these columns on the purchase sheet must be combined with those of the cash sheet to show total cost of operating.

Assuming you have now kept complete records for a year, we are concerned with determining our present financial condition.



Two problems present themselves: First, what are our assets, our liabilities, and what is our present worth? Second, what has been our income, our cost of operation, and our net increase or decrease in operation?

Problem one, our present worth, will be our present inventories, the personal accounts and notes due us, and our balance of cash, minus the debts and notes we owe.

Problem two, income will be the total receipts, and our cash-operating costs will be the sum of the various footings of the columns on the cash sheet. Our net increase or decrease in operation will be found by adding our cash income and sales on account, and deducting the cash operating costs, the operating purchases on account together with any depreciation in equipment shown on the inventory sheet.

To illustrate, assume that at the first of the year you started with real estate valued at $2,500 and equipment of $500. Your worth at beginning is $3,000. At the end of the year your inventory shows real estate valued at $2,500, implements $500 less $50 depreciation. Your cash sales were $1,600 and your sales on account were $400. Your purchases on account were $100 for repairs, upkeep, etc. Then we are worth today in real estate $2,500, equipment $450, personal accounts $400, cash $953.74—total assets $4,303.74, minus the liabilities, $100, or $4,203.74. Our income was $1,600, our cash operating costs $646.26. Our net increase is the total sales ($1,600 our cash plus $400) $2,000, minus the cost of operation ($646.26 cash plus $100 on account) $746.26 and depreciation ($50, or $796.26), leaving $1,203.74. This increase, when added to our original worth, $3,000, equals our present worth as found above, $4,203.74.

This I would suggest, that you keep some sort of graph, or picture, of your operations which can be adjusted each year but which shows at a glance what progress is being made. See the following:

I want to reiterate that the most important thing is for you to make the record; that is where most of us fail. I know one man who is keepiag a record of his work, who does it on a calendar. Well, that is all right; I don't care what you use for your book account; he writes it there, and at the end of the month he turns to this sheet and groups these items together, transferring to permanent sheets. If you want to keep books that way, it gives fairly good results—you have your record, anyway, at the end of the year, and that is important.

The time to do this posting, I suppose, for most of us, is along about the supper hour, when the day's work is over; record what you have for the day's business. Most of these men who are working for the horticultural office here, who have to go out and do field work, must make a record and report, so why can't we all do it? The end of the day's work is the usual time. Let us try to mark the day's report somewhere—on the calendar, or wherever most convenient—and then, when you get the totals at the end of the month or year, it is very simple to figure up and determine where you stand.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Spraying Tests Developed Important Results

By E. J. Newcomer, Scientific Assistant U. S. Bureau of Entomology

During the season of 1919 the United States Bureau of Entomology, in co-operation with the Washington Experiment Station, carried on an extensive experiment for the control of the codling moth in a 13-year old orchard near Yakima. Tests were made of several arsenical poisons, and of various methods of applying them. These included the use of guns in place of rods, the use of a spreader, and extra calyx and cover applications.

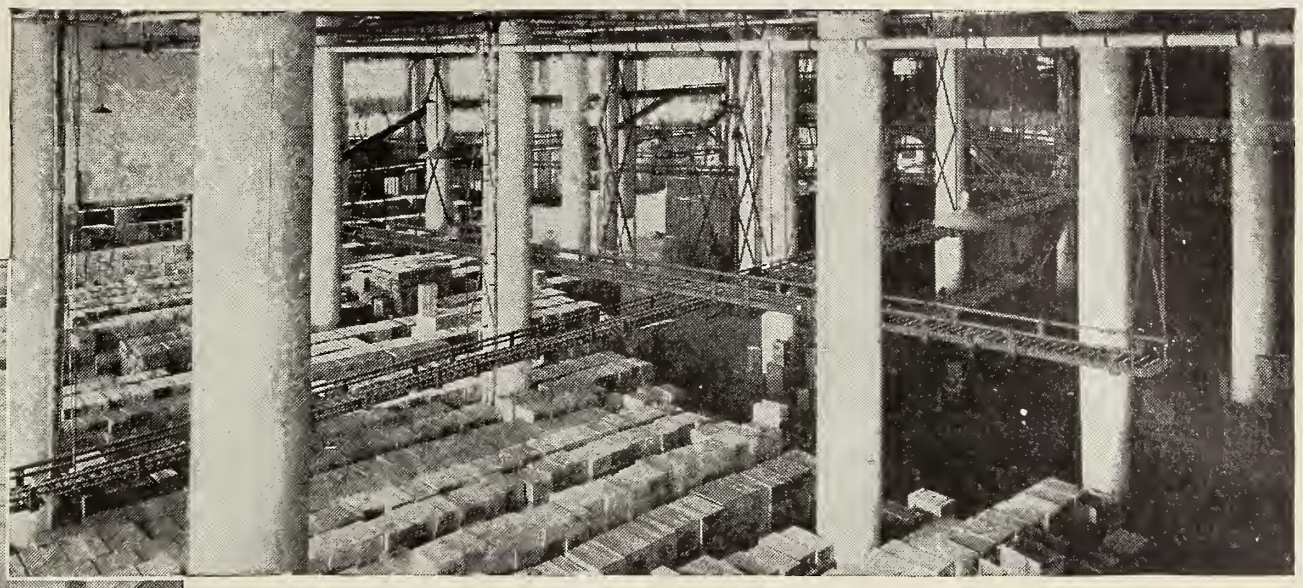
"We have carefully compared all these variations with a standard method of spraying, which consisted of one calyx and four cover sprays, five sprays in all, using the rods and powdered arsenate of lead, one pound to fifty gallons.

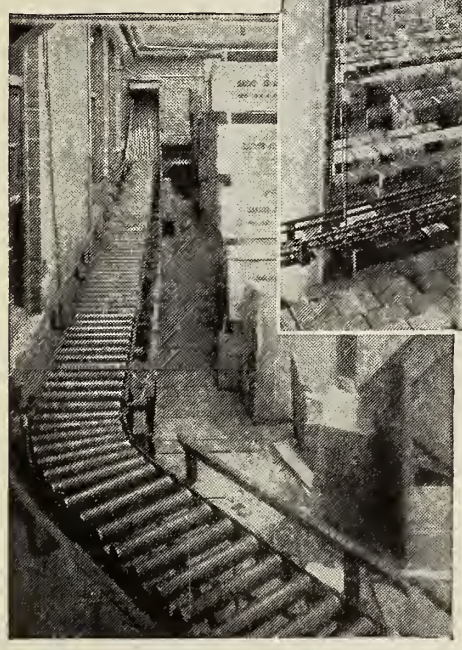
We have figured the results, not only in percentages of wormy and clean fruit obtained, but also in dollars and cents. First, we have figured the actual value of the fruit, then the actual cost of spraying, and from these figures we have obtained the net value of the fruit sprayed by each method. Other orchard costs and damage to fruit from causes other than the codling moth, are not considered, since they would be the same, no matter what method of spraying was used. These figures are much more satisfactory than the figures showing the number of the wormy apples, since these latter do not take the cost into consideration.

Probably most growers, if they have not already decided it for themselves, want to know whether the gun is more efficient than the rod. Many people already realize that it is quicker and takes less spray, but does it do the work? In other words does it pay? Our single year's work shows that it costs about one-fourth less to spray with a gun than with a rod, and that if properly used, the fruit will be just as clean as though sprayed with a rod, if not cleaner. It therefore does pay but the amount saved is not very great, and may be lost with careless work.

Another question frequently asked is whether it does not pay to use more lead per tank. We used three pounds of powdered lead to every fifty gallons in one plot, and got enough more clean fruit, as far as worms are concerned, to pay for the extra lead. But we had too much poison on the fruit at picking time, and with many varieties the amount of color may be reduced.

We cannot recommend using lead stronger than one pound to fifty gallons. If you have some extra lead you want to use put on six sprays instead of five. It only costs about 10 cents to spray a tree once, and if timed right you can save a dollar's worth of fruit. In the orchard we sprayed, we actually did save the owner more than a dollar's worth of fruit on every tree we sprayed six times instead of five. This was with an average yield of fifteen boxes per tree.





With a Mathews Conveyer system the California Associated Raisin Company can fill or empty this warehouse in one-fourth the time and with one-fourth the labor it would require to do it by wheeling, trucking or carrying. And note the floor space saved! Mathews Conveyers are just as practical in your line of business—indoors or out.

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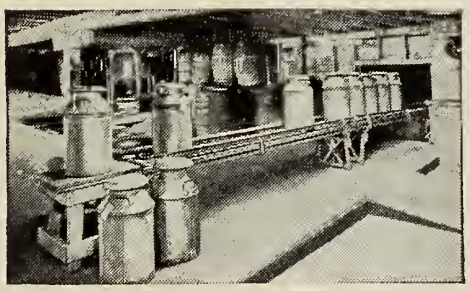

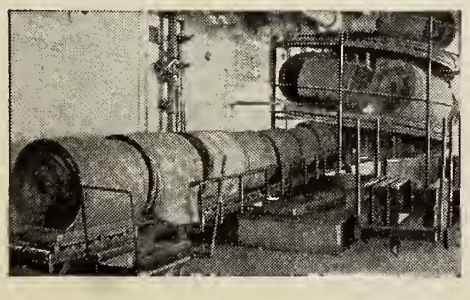

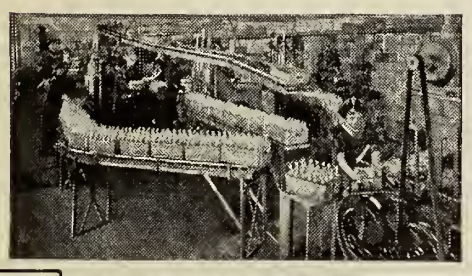

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BETTER FRUIT
An Illustrated Magazine Devoted to the Interests of Modern Fruit Growing and Marketing.
Published Monthly
by
Better Fruit Publishing Company
703 Orcgonian Building
PORTLAND, OREGON

Improved Drying Processes.

In publishing the details of the new fruit evaporator recently perfected at the Experiment Station of the University of California at Davis BETTER FRUIT is doing so in the hope that it will prove of benefit to many growers who are somewhat at sea in regard to processing prune and other fruit crops. The great increase in the prune crop in the Pacific Northwest is making it necessary to provide greater and better drying facilities and withal, for growers to secure a dryer at a nominal cost that will handle their crops expeditiously.

While growers and others who are familiar with driers of various types may not agree with all the statements that Mr. Cruess makes in regard to the apparatus which the University is so highly recommending it should be borne in mind that it has been subjected to tests for some time and its nature so fully explained that the grower is not left in the dark. It is also being put before the public to accept or leave alone without cost. Another point is that although growers who are in need of a drier may not wish to use all its features there may be some of them that they might embody in their present plants at a distinct advantage.

Saving the Crop.

While improvement in labor saving packing house and orchard equipment has probably been slower in coming than in many other lines there are many devices now on the market that mean large savings in handling fruit crops. Yet we are told that it is more or less difficult to get growers to depart from the old way of doing things and try the new and more economical. In many instances where crops could have been handled with greater rapidity by these new devices and saved, large losses have been sustained through lack of storage, bad weather at harvesting time or some other cause. The orchardist who is able to move his crop to market early in the season is playing the safest and most successful game in the fruit business as a rule. Anything that helps in this process therefore should not be neglected and any needed apparatus or equipment will pay for itself many times over.

The Penalty of Neglect.

Neglecting to eradicate or control fruit pests is always disastrous. The fact that the grower may have some insignificant looking insect in his orchard that does not appear to be doing any particular damage at the time being is no excuse for his not investigating. A slight infestation this year may mean a very extensive one next year with attendant heavy losses. In their investigations of diseased or pest infested fruit trees specialists have found almost invariably that had these cases been reported to authorities on the subject at the time of their inception the disease or pest could have been stamped out, many thousands of dollars saved and years of toil avoided. If you have a condition in your orchard fruit that you know is not normal and don't know what it is, consult some one who does. Or if you do know what it is don't negect it.

The Transportation Problem.

Continued reports of an expected shortage in cars to handle the fruit crop during the heavy shipping season this year make it imperative that no step be neglected to avoid such a contingency if possible. For shipments to nearby points considerable help in this direction can undoubtedly be secured by establishing motor truck lines as is being done in the East. At least this is a point that may well be considered by shippers in their efforts to reduce to the minimum the number of cars needed. By investigating the possibilities of utilizing to some extent this mode of shipment in each of the fruit shipping territories it is more than probable that fruit transportation can be greatly aided.

As the large bulk of Northwestern tree fruits, however, are destined for far away points we again wish to call attention to the advisability of organizing committees, or other bodies, or securing individuals to take charge of the matter of the car situation at an early date. If nothing else is accomplished the information that will be secured will be of vast benefit to both shippers and growers in regard to crop movements and in providing storage.

Fruit Picking Prices.

In California fruit picking prices are are not a matter of individual bargaining. Organization largely rules in this as in other phases of the fruit industry. It is therefore interesting to read the following item taken from the California Fruit News:

"A meeting of growers in Santa Clara Valley, who are members of the Farm Owners and Operators Association there, met recently in San Jose, and after a discussion of the question of wages for fruit pickers and orchard help this year, passed a resolution establishing the wage scale at 50c an hour. The resolution provides that there is to be no overtime paid and that the wage is 50c straight for whatever number of hours the worker may be employed or work. This makes it unnecessary to determine a day's work, as conditions vary from day to day and orchard to orchard in this regard. The orchardists expressed the opinion that the help available was as sufficient and efficient at that price as under any other conditions. The same organization has chapters in other counties and uniformity of action in this regard is expected to prevail."

Mechanics and Agriculture.

It would seem that some of the hard grind that has made the life of the fruitman during the period of cultivation and spraying not of the pleasantest, may be eliminated to some extent. The coming of the tractor has greatly helped in the matter of cultivation and now the combining of the tractor with the sprayer bids fair to still more lessen the work of one of the most disagreeable tasks in an orchard. Gradually the inventor and the expert mechanic are bringing to all phases of agriculture the benefits of labor-lessening motive power. It is not too much therefore to expect in the future that with the extension of most of the city conveniences to the farm and orchard the tide of human endeavor will be toward the soil instead of away from it. With the joining hands of mechanics and agriculture no one can foretell how the model farm or orchard may be conducted in the years to come and not so many years at that.

What They Say About Better Fruit

I am sending you today money order for one year's subscription to BETTER FRUIT. If collection by post should not be possible will you please remind me when I should renew my subscription and I will send the money at once, for I cannot afford to miss this fine magazine. —W. Schnyder, Uttewyl, Switzerland.

Received the numbers of BETTER FRUIT and wish to state that the article on spray vs. dust for codling moth control was worth more to me than the price of the paper for a decade. I was on the fence in regard to the methods to be employed until I read this article through thoroughly. I can now begin our codling moth spraying in a few days with a duster and power sprayer both at my command and do the work intelligently. I enclose my check for the year.—W. G. Yeager, Taylorsville, North Carolina.

Mr. Baker, one of our directors, reported to a recent meeting of our dirccors the kindness, consideration and assistance which you so kindly afforded him during the time he was in London and New York. We beg to assure you that your courtesy was not only appreciated by Mr. Baker, but also by our directors, and we beg to convey to you their best thanks.—The Wargundy Orchards, Limited, Bloemfontein, South Africa.

Former address Fremont, Michigan. This position which I now hold here was procured by advertising in BETTER FRUIT, and I want to thank you for the great assistance you have given me.—Alton M. Porter, Marble, Washington. Former address Fremont, Michigan.

Under separate cover I am sending you some information about our apple show. I visited Oregon several years ago and retain very pleasant recollections of it. I take your paper and find it very intcresting and full of useful information.—L. M. Shootridge, Hobart, Australia.

Will you kindly forward me some information in regard to combatting thc apple leaf hopper and the woolly aphis. If my subscription is in arrears please let me know and I will send check. I also wish to say that your paper has been of much help to me in solving the problems of the fruit business and I wish to express my deep appreciation of your valued publication. — W. Clark McGinnis, Orondo, Washington.

Nobody begrudges the retailer a reasonable profit on perishable goods but when he can buy a crate of onions for less than $2 and sell them at $7.50 it looks like he's serving himself better than he is the public.—*The Packer.*

Northwest Cherry As An Income Producer

By C. A. Bell

CHERRIES! Don't your mouth water at the very mention of the word?

To one who lives in the east or the middle west a cherry means a small red fruit sour enough to make a pig squeal but capable of making delicious pies or preserves, granted there is no limit to the sugar supply.

Several varieties of sour, or so-called pie cherries are successfully grown in the middle states, notably the Early Richmond, Late Richmonds, English Morello, Wragg, and Montmorency.

But when you say "Cherry" to a resident of Washington, Oregon or Idaho, it runs the gamut of all the delicious, soul-satisfying list of sweet, sweeter, sweetest black, blacker, blackest, pink, pinker, pinkest, redest, purplest and liver-colored varieties known to modern horticulture, and among which at least one can be found to suit everybody, and most people like the whole list.

And what fruit so universally appeals to a human being (or a bird) as the cherry?

If you doubt it, just come to Cherry Lane, a mile or two from Grandview, Washington, some Sunday afternoon in June and sit under a tree unobserved, and see how many of the three or four hundred automobiles can get by without having "car trouble" that necessitates a stop.

Other fruits there are that are good but the cherry is the first tree fruit of the season and you need the wholesome, sprightly, acid and sugar combination to get the bile out of your liver and the grouch out of your system.

But what about cherries as a cemmercial crop?

Are they profitable?

Can they be depended upon to produce every year?

How many tons per acre would be a paying crop?

Has the market ever been overstocked?

What varieties pay best?

Where is the market?

How old must an orchard be before it will pay expenses?

Hold on now—one at a time—it would take a big book to hold all that the writer does not know about cherries, but he can relate some of his experiences as a grower of cherries on a small scale for 16 years, in the state of Washington.

Some things he has learned that have been too well demonstrated to be any longer in doubt as to profit, we know of no fruit grown in the Yakima Valley that will show more net profit per acre than sweet cherries.

Why? Because people will eat them even if they cost 40 or 50 cents per pound.

Because the territory upon which sweet cherries can be successfully grown is so limited in comparison to the territory upon which most other fruits can compete with us.

Because the trees grow very rapidly, come into bearing very young, cost much less for spraying and pruning than other fruits, and the fruit itself is so perfect that there are no culls worth mentioning.

Everything depends, however, upon a very few essential points.

Location is the most important.

One must have good elevation.

Good soil drainage.

Good air drainage.

Good nursery stock.

Good varieties.

Convenience to shipping point.

The market proposition is in a large measure solved by the canneries recently erected at nearby points and by the square dealing fruit buyers who have warehouses by the dozen throughout the whole Yakima Valley. They have paid from 7 to 12½ cents per pound without packing or package for the past two seasons.

If one has facilities for packing at home, and knows how to put them up

and where to ship, much more can be realized.

As to varieties, the writer considers the Bing far and away in the lead, all things considered. It combines good quality, large size, tough skin, which makes it the very best shipper, and immense yielding capacity, and ebony color. It will not, however, produce well planted in solid blocks unless some other pollenizer is provided at right intervals.

Black Republicans, Tartarian, Governor Wood, all serve the purpose, but for maximum results we recommend budding or grafting into each Bing tree a small twig of the Mazzard seedling.

Next to the Bing, we have found the Lambert most profitable. It has two serious faults; one is a tender skin which cracks in case of showers, and a propensity to shell from the stem and drop when over-ripe or in windy weather.

Third on the list we would place the Royal Anne, or as it is sometimes called Napolean Biggareau.

This is indeed a noble cherry with strikingly beautiful tints of white, pink and dark red, its snappy, tart, rich juices and its remarkable bearing qualities. It is the favorite for commercial canning and for maraschino preserves.

The Late Duke, while not as profitable as the sweet varieties mentioned, is the surest cropper of all, withstands severe frosts at blooming time and blooms last. While classified as a pie cherry it is far from sour when well ripe and nearly as large as the Royal Anne. It can be successfully grown where the sweet varieties would freeze out nearly every year.

How many tons per acre can be produced?

We should hardly dare to name the amount we believe possible but we have grown eight tons on much less than an

acre and $60 worth on a single tree eleven years old. We have never missed a paying crop in the six or seven years the trees have been in bearing and would not consider $1,000 per acre anywhere near the value of a first class cherry orchard old enough to bear.

We make no claims that we do not believe this can be duplicated or surpassed by some of our neighbors as to yield, profits, or faith in cherry orchards.

We should take pride in showing anybody some of the top notch young cherry orchards within two or three miles of Grandview, Washington.

Yes, we are a crank, and frankly admit it.

Logged-Off Land for Nut Growing

By N. E. Britt

MY conclusions as to the possibility of nut-growing on logged-off land are based chiefly on my own experience. In 1910 I planted between four and five acres of seedling Franquette walnuts on land which had been quite heavily timbered with fir. The large trees had been cut several years before the stumps of which I removed, and planted seedling Franquette walnuts, 52 feet apart. In 1917 I put out 600 filbert trees in part of my walnut orchard, planting the filberts between the walnut trees, 13 feet apart. The walnut trees are just beginning to bear and I am delighted with the prospects. I have noticed some catkins on the filbert trees recently, which give promise of some nuts next season. The trees have made splendid growth and are very vigorous and promising.

These lands are on Parrett Mountain, about 700 feet above sea level. The soil is what is generally designated as shot land, with about as near perfect drainage, both air and water, as could be desired. I consider the elevation gives them much protection from both spring and fall frosts. Much similar land, in soil, drainage and climate is in western Oregon and Washington, varying in altitude from 400 to 2500 feet above sea level; the timber of which has been removed by loggers and forest fires. These lands are encumbered with stumps, snags, logs, and brush, fir, hazel and laurel.

Burned over lands are more easily put in cultivation than the logged-off lands. Much of the land is embraced in the land-grant of the O. & C. Railway Company, which the road claimed for a number of years. Recent decisions of courts place title to these lands with the United States, and a part of them are now offered to homesteaders at $2.50 per acre and residence of three years. There are some other requirements, as to cultivation and improvements, with which I am not familiar.

I am aware of two nuts indigenous to these lands, the hazel and chinquapin, which, I suppose, indicate that the chestnut and the filbert could be grown. The English or Persian walnut, filbert, black walnut, butternut, chestnut and hickory-nut are now grown on similar land. But as the English walnut and filbert are so superior to the others mentioned, walnuts and filberts only will be considered.

I am aware these lands, encumbered as they are with stumps, snags, logs, fir, hazel, dogwood and laurel brush, do not present a very inviting prospect for nut culture; but explosives and fire get away with these encumbrances, leaving a soil supplied with all of the elements of tree-growth.

I would pursue different methods in starting a filbert or a walnut orchard. Filberts should have the land thoroughly cleared and prepared. For walnuts I would saw down the snags and burn them and the old logs; would grub out the hazel, dogwood and laurel; cut small fir and brush and burn them, leaving the large stumps, and plant walnut trees wherever there was room, regardless of rows; would enclose my planting with a fence, and protect my trees with wire netting, and pasture with sheep; would spade around the walnut trees in the spring, for four or five years, after which I think the trees would thrive and take care of themselves.

In conclusion I will say, considering soil, climate, and drainage, the possibility of these lands for nut-growing is very inviting and big with promise.

Apples Suitable for Evaporation

There is an increasing demand for dried apples of the highest quality. The tendency has sometimes been to make quantity at the expense of quality. But prices are governed not only by the supply but also by the grade. The cleanest, whitest fruit, that is well cored, trimmed, bleached, ringed, and dried, is most in demand. Carelessness in any particular injures the product.

Primarily the economic usefulness of an apple evaporator is through its utilization of windfalls and the poorer grades of fruit which cannot be marketed to advantage in a fresh state, and it is these grades that are most often evaporated. But the magnitude of the crop also influences the grade of the evaporated product in a decided way. In seasons of abundant crops and low prices for fresh fruit large quantities

of apples that would ordinarily be barreled are evaporated and the grade of stock produced is correspondingly improved. On the other hand, in years of scanty crops, when all apples that can possibly be shipped are in demand at high prices, only the very poorest fruit is evaporated, as a rule, thus lowering the grade of the output.

The commercial grading of evaporated apples is based primarily on appearance rather than on dessert quality, and the fact that one variety may make a better flavored product than another is not considered. As a rule, a product of high commercial grade can be made from any sort which has a firm texture and bleaches to a satisfactory degree of whiteness. A variety of high dessert quality, such as the Northern Spy, may be expected to make an evaporated product of correspondingly high flavor.

In sections where the Baldwin apple is grown extensively, it is in demand at the commercial evaporators, as it meets the requirements in a fair degree and it is also available in relatively large quantities. In the Ben Davis sections that variety supplies a similar demand.

Most early varieties lack sufficient firmness of texture for the best results and are undesirable on this account. On the other hand, some comparatively early sorts, such as Gravenstein and Yellow Summer Pearmain, are considerably prized in some sections. The dessert quality of the latter is especially high.

Similarly the product made from other sorts possesses qualities that are due more or less to varietal characteristics. For instance, that from Esopus is said to be unusually white; Hubbardston and varieties of the Russet group also make very white stock. The latter make relatively a large amount of stock, by weight, to a given quantity of fresh fruit. Limbertwig is said to produce from one and one-half to two pounds a bushel more of dried stock than most sort do, but it is not as white as that from some other varieties.—The Evaporator.

Leaf Roller Serious Pest

The seriousness of the leaf roller as a pest was recently shown to a large number of growers in the Spokane valley when an orchard demonstration was held by the district horticultural inspector in that district to show the results of its work. It was found that in many instances the work of this insect had been so destructive that there will be but little fruit and in some cases none at all. In telling of the difficutly in getting the growers interested in combatting this pest the horticultural inspector writes BETTER FRUIT as follows:

"During last season the writer encountered in the Spokane Valley the larva of the fruit tree leaf roller working in some of the orchards and tried to impress upon our growers the serious nature of this pest—it is quite apparent that we did not get very far in this matter for most of them felt that it was a "joke"—but I can assure you that they have now decided after seeing the ravages of this little "chap" thus far this season, that they really have something that is going to put them out of business if they do not concentrate every effort to exterminate it. We have only recently been able to hold an orchard demontration at which were present 175 fruit growers, and we finally took steps to secure something definite in the nature of a supply of miscible oils for another season's spraying campaign, which by the way so far has

proven even in a limited way that it can be depended upon as a control measure.

"My reason for bringing this to your attention is that it might arouse some other locality or district which has a few of the leaf roller present, but not a sufficient number to cause a great amount of damage, and impress upon their minds that it does not behoove them to take a chance with these "fellows," as they will not only de-foliate the trees but also eradicate the crop when they become numerous enough."

Growers Select Trade Name

The Oregon Growers' Cooperative Association has selected its trade names. The principal name to be used is Mistland. A second name which will be usel on some of its products, especially on dried and canned goods, is Firland, and a third name that will be used is Truwest. These names are now being registered. California has capitalized the sun. Northwestern fruits are of superior quality due to a happy combination of soil and climate. In every valley of Oregon especially in the spring and fall thin veils and banks of fog and mist drift down against the hills. It is a scene that every Oregonian is familiar with. Oregonians are often afraid to mention the fact that we have a little rain and mist occasionally. This mist however, is one of the greatest assets of the country west of the Caccades and contributes to its richness, its great output, and the high quality of its fruits. Hence Mistland seems to be a very appropriate name.

Drying Saves Cherries.

Within twenty-four hours after the rain stopped on the morning of July 14th, cracked cherries were being pitted and dried by the Oregon Growers' Cooperative Association at the rate of ten tons a day. A cherry pitter was installed at the dryer of Geo. W. Weeks, two and one half miles north of Salem, and operations started. A day later the dryer of F. E. Evans was also in operation to handle the overflow. Cracked cherries have been hauled from all parts of the Salem district as well as from Amity. At least 100 tons will probably be saved from total loss by pitting and drying them.

To Direct Sutherlin Plant.

J. O. Holt has secured Loyal V. Emery of Sutherlin to take charge of the new plant which the Oregon Growers' Association recently purchased from the Sutherlin Fruit Products Company. Mr. Emery is well and favorably known in the Umpqua Valley and is one of the largest prune producers in that section of the state.

Has Thirteen Hundred Members.

The Oregon Growers' Coöperative Association, which now has 1,300 members, with an acreage of 26,000 acres in fruit, is making arrangements to announce to growers how the fruit will be pooled and what the prices of the fruit will probably be.

Cover Crops, Tillage, Etc.

Continued from page 5.

With these few of the many advantages derived from the use of cover-crops in mind we will consider in brief their value as found from the standpoint of increasing the nitrogen content of the soil.

For our conditions in Montana experience has shown that humus is always needed, and while it may be secured by using a crop of oats, wheat or rye, it is also possible to secure nitrogen at the same time by using a leguminous crop. For this reason clover and peas have been selected as our best crops for use in building up the orchard soil.

At the Horticultural Substation in the Bitter Root Valley an experiment has been carried on since 1908 to demonstrate the value of cover crops of clover and peas to increase the nitrogen content of the soil. The system followed was to seed clover in May and plow under the fall of the following year. With the peas which were also sown in May the turning under was done the same fall. In order to successfully control the weeds it was found necessary to clean cultivate every third year. The part of the experiment where clover was used consisted of two plots of an acre each. One plot all the growth was plowed under, and on the other all the growth was removed. With the peas all the growth was plowed under. A fourth plot was used as a check plot and was clean cultivated continuously.

The first analysis was made in 1916 after the experiment had been in progress for eight years. The nitrogen content of the first two feet of soil in the plot which had been clean cultivated during this time was 1514 pounds, while that of the plot which had had the clover—tops and all—plowed under was 3019 pounds, or a variation of 1505 pounds. The comparison may mean more with the variation stated in terms of a common nitrogenous fertilizer. To bring the nitrogen content of the clean cultivated plot up to that of the plot which had been cover-cropped with clover would require an application of approximately 9406 pounds of commercial fertilizer.

The second clover plot which had been treated in the same manner but had had all the growth removed, leaving only the roots and some stubble, showed a total nitrogen content per acre of 2167 pounds or 882 pounds less than where no growth had been removed, and 653 pounds more than the clean cultivated plot.

The plot on which peas were used for a cover-crop showed a total content of 2375 pounds of nitrogen per acre or 861 pounds more than the clean cultivated plot and 644 pounds less than the plot

in clover which had all the growth plowed under. As compared with the clover plot with all the growth removed there was a variation of only 2 08 pounds in favor of the peas.

The most interesting thing, however, and the point which prevents many orchardists from using cover crops, is the cost of the cover-crop seed. While I do not have the figures here the final result showed that the cost of clean cultivation was greater than where the cover-crops were used.

Last year samples of soil were taken again from the various plots, and while we are not able to give the results as yet, we anticipate important results from the tests.

The nitrogen content of the soil is not the only variation we have found in the work with cover-crops. The trees on the clean cultivated plot are a sorry looking lot, and many have either died or been badly affected with the so-called winter injury or "rosette" which is very common on soils deficient in plant foods. The trees on the cover-cropped plots are uniformly healthy and quite normal. The most important variation is that of the fruit production. The plot in clover where all growth was plowed under, and the plot in peas have produced the highest yields of fruits, and the clean cultivated plot the lowest. This was true in 1916 and is more marked in the records of the past three years since 1916. In the course of another year a second report will be prepared which will show some definite results, and from which some final conclusions may be drawn.

In this work no attempt has been made to increase the amount of potash or phosphoric acid, the idea being that these were present in abundance for the present at least. Reports from other stations show that the fertility of the orchard soil may be maintained by the addition of fifteen tons of barnyard manure per acre every three years. This is said to be able to take place of cover-crops from the standpoint of humus and in addition supply the amount of nitrogen, potash and phosphoric acid required to produce an annual crop of 160 barrels of apples.

The fertility problem which the orchardist of today faces is the same that confronts every other tiller of the soil. The only safe and sane method of soil management is that which returns to the soil an equal or greater quantity of plant food than which is removed by the annual crop, and by leaching and washing away. This and no other method will build up a permanent agriculture. When the measure of a successful farmer or orchardist is the maintenance or increase in the plant food content of the soil instead of his bank account, then will he pass from the soil robber class which is not far from the bolsheviki, to that of the desirable citizen. While our experiments with cover-crops have shown beyond doubt that cover-crops, especially of the leguminous class, furnish a cheap and dependable supply of humus and nitrogen, we feel that in the not far distant future additions of potash and phosphoric acid will be profitable if not absolutely necessary.

As yet our experiments with commercial fertilizers have been too incomplete to draw conclusions from, but some desireable variations have been noticed and in the near future it is hoped that this work may have been extended considerably.

For the benefit of those who use or anticipate the use of peas as a cover crop, I might relate our experience in plowing this crop under. After two

years of experimenting with various attachments on a fourteen-inch plow, and the use of much main strength and awkwardness, I conceived the idea that a little force applied to hold the plow in the ground to force the coulter to cut the vines might assist. To accomplish this I attached a riding attachment and a large riding rolling coulter to the walking plow. The latter was placed well forward on the beam with the point of the attachment as far behind the center of the coulter as possible. The edge of the coulter was kept sharp by frequent grindings. Just previous to plowing the vines are disced down the way the land is to be plowed, as the coulter cuts better when they are in a solid mat. Two men are required for rapid work. One rides and drives, his weight preventing the coulter from riding over the vines, while the second follows and assists the obstinate bunches of vines under the furrow.

Methods of Saving Winter Injured Trees

IN a statement recently made to Hood River growers in regard to methods that should be pursued in handling winter injured trees, Gordon G. Brown, Horticulturist at the Hood River Experiment Station treats the subject in a way that is of value to all growers whose orchards were injured by low temperatures. It is explained that the so-called balance existing between the root system and the top was greatly disturbed by injury to the latter.

"The extent," says Mr. Brown, "to which the top has been injured varies all the way from almost nothing to as high as one hundred per cent. The killing back of so much tissue above ground, however, cannot be in all respects, likened to the removal of a similar amount of wood through the agency of pruning a non-injured tree. Were such the case, the wood growth on trees now making but feeble growth would be tremenduous. The remaining tissue is also injured, which explains why a vigorous growth thus far has not resulted.

"It will be well to explain briefly how a tree functions and what lack of balance means. Last year the trees had a large leaf surface which was capable of supplying the requirements of a large root system. The root and top are said to be in balance as evidenced by heavy fruiting and lack of excessive wood growth. During the latter portion of the 1919 growing season the leaf system was manufacturing and storing up plant food for use during the 1920 season. This is the supply now being furnished by the root system, without which present growth would not be possible. Beginning with the formation of the terminal bud, the leaf system will again manufacture and store plant food for next year and the further maintenance of the root system. It is apparent, therefore, that as much leaf surface as can be maintained in vigorous condition should be encouraged this summer. Obviously no pruning which will remove leaves capable of functioning should be done. To do so would mean root starvation and an enfeebled tree.

"The above is not to be construed that no pruning at this season is advised. The removal of dead limbs has certain advantages well worth while. Such limbs are more easily detected by the average pruner now than during winter and can therefore be removed at less expense. Furthermore, on trees with fruit, the tendency for such limbs is to scratch the fruit and lower its quality. The psychological influence on the grower in being rid of so many "eyesores" is likewise apparent.

"Let the grower decide now whether the tree is worth saving. Do not be influenced alone by the growth above the main crotch. Examine the trunk thoroughly. At a distance it may look fairly normal. Possibly it is girdled half way around. That means a gaping wound which may not heal over for many years or probably never. In the meantime it is subject to heart rot and similar troubles. Regular painting and disinfecting must be done to save such a tree. The writer doubts if it is worth while to save such a tree, especially if it is old. It can be done of course and a fair tree rebuilt, but it will probably never again become a first-class tree. The expense in rebuilding a tree is great in that much labor and time are expended before it comes into full fruiting again. Furthermore, it is doubtful whether it pays to save trees with impaired trunks, especially where a larger portion of one side of the top is dead. Such trees will require great care in rebuilding in order to induce proper shape. Therefore, in deciding whether to save a tree consider the location and extent of injury, the variety and the time and expense versus what you will have as a reward for your trouble.

"If however, the grower decides to save the tree do not at this time remove anything but dead or dying wood. No matter what shape the tree may have when this is done leave the remainder. Next winter corrective pruning may be attempted, but it is out of place now.

"Care must be exercised to avoid sunscald where large limbs are removed. This is important. Keep the wounds painted and cover the trunk and main branches with whitewash in order to deflect the sun's rays as much as possible."

Northwest Fruit Notes from Here and There

OREGON.

The cherry crop at Mosier this year is reported to have been above the average in quantity and of fine quality.

A large tonnage of the Douglas County prune crop is said to have been contracted at 16 cents a pound.

The longest orchard in the world is stated to be that of the Dufur Land and Orchard Company, seven miles from The Dalles. The orchard, which is largely apples, is nine miles in length and occupies 5,000 acres.

A small shipment of Gravenstein apples which arrived on the market in Portland from The Dalles July 15 is said to have broken the record for early fall apples. Veteran fruit dealers said that they had never seen this variety of Oregon apple on the market at this season of the year before.

D F. Fisher, plant pathologist with the United States Department of Agriculture, who was assigned by the department to make an investigation of winter injury to fruit trees in the various sections of the Willamette Valley, recently stated that orchards in Marion County had made an excellent recovery since he first examined them in February. While some of the varieties of fruit trees that were injured will have to be taken out, the greater part can be saved by careful treatment, Marion County growers were warned by Mr. Fisher that winter-injured wood is subject to heart rot and advised the careful protection of all pruning wounds and cracks in the bark.

Cherry growers in the Willamette Valley sustained a considerable loss due to a rain in July, which fell for the greater part of a week in that section, causing the fruit to split and making it unsalable. Bings and Lamberts were the varieties that suffered the most damage. Some of the canneries continued to accept fruit that was not too badly injured. A large part of the crop had been picked and marketed before the rains came. The prices received by most of the growers was 13 cents per pound. In the Salem district where loganberries are grown extensively the rain is said to have done little damage to this fruit. The average price paid for loganberries in this district this year was 13 cents.

An interesting fact discovered recently by Leroy Childs of the Hood River Experiment Station was that the d'Anjou pear trees in that district were the most frostproof of any of the tree fruits grown in that district. Mr. Childs says that although most of these trees were set in tracts where one would expect the worst frost damage they emerged in better condition than any of the other trees.

According to J. O. Holt, manager of the Eugene Fruit Growers' Association, Lane County will harvest the largest crop of prunes in its history this year. In fact, the crop is expected to be so large that it is feared that the dryers now in existence in that district will not be able to handle it.

The Dalles cherry crop, which was one of the finest this year that has ever been harvested, resulted in highly profitable prices to growers. While many tons of fresh fruit was sold on Eastern markets, the local canneries purchased 500 tons, for which they paid $300 a ton.

Denney & Co., fruit shippers and packers, have leased the building formerly occupied by the Rogue River Fruit Association at Medford and will conduct their business from the new plant in future. M. E. Root is the local manager in charge of the Denney interests in this district.

Carlot shipments of Hood River strawberries were limited this year to fifty-nine, or only about 60 per cent of the tonnage shipped last year. Continued late cold weather is said to have been the cause of the short crop. The average prices received, however, are reported to be the highest ever known, both for fresh fruit and from the canneries.

The Hood River Apple Growers' Association which has just closed its apple business for the past year announces that its total returns from all apples reaches $2,686,986.88. It is estimated that this year's output of apples from Hood River will only reach fifty to sixty per cent of last year's tonnage, but that the fruit will be of exceptionally fine quality.

C. E. Stewart, county fruit inspector for Lane County, reports that fire blight has appeared in two orchards in that section in malignant form. Steps have been taken by the county authorities to prevent its spread. Apple growers in Hood River County have also been notified by the local experiment station that this disease has appeared in orchards there in a mild form and instructions have been given for its treatment.

The Juniper Flat country near The Dalles, which for many years has been devoted to wheat raising is now becoming dotted with orchards, berry patches and diversified farms due to the fact that irrigation has been secured. In area the flat contains about 100 square miles.

The location for the model fruit farm which will be established near Albany to demonstrate how to raise fruit and berries desirable for canning it is stated will be chosen in the near future. The farm will be operated by the Puyallup & Sumner Fruit Growers' Association which owns a cannery at Albany.

WASHINGTON

Although the yield of cherries in the Grandview district this year was light it is estimated that it totalled over 170 tons. While the quality is reported very good the size of the fruit was a little below the average.

Information from Clarke County, is to the effect that the prune crop there is expected to exceed that of 1918 when it reached a total of over 13,000,000 pounds. Loss from the June drop this year was very limited. Up to during the early part of July about 500 tons of prunes had been sold at a price of 15 to 16 cents for 30-35s f.o.b. drier. The larger part of the crop however is being handled by the Washington Prune Growers' Association which closed its pool July 20 five days later than the Oregon Growers' Association. The Washington organization is building a large packing plant at Vancouver to handle its tonnage from 2,000 acres of prunes belonging to its members. It is expected that the plant, which is one of the largest and most modern in the Northwest will be completed by September first. The operations of the association are under the management of M. J. Newhouse who has as his assistant Edward J. Bodey.

Wapato is now said to have the largest and most modern dry storage warehouse in the Yakima Valley. The structure which belongs to the Pacific Fruit and Produce Company cost $70,000 and is 200x155 feet. It is of concrete construction with a storage capacity of six hundred cars. This company maintains forty-three warehouses at different points in the state. John C. Koresky will have charge of the company's business in the Wapato district.

Among the activities of the Yakima Growers' Association is the continuation of their national advertising campaign for the third year. This will consist of the use of color pages in the prominent eastern magazines which are reaching millions of families in the United States. An improvement in the association's cold storage and warehouse facilities, is the erection this summer of a cold storage plant at Kennewick. With this new plant in operation the association will have a combined cold storage capacity of 750 cars.

An improvement in orchard machinery that has been attracting a good deal of attention in the Yakima country is the Fordson-Bean Tractor-Sprayer. The apparatus consists of a specially manufactured bean sprayer which is coupled to the rear of the tractor and obtains its power direct from the crankshaft of the tractor, in this way obtaining a very high pressure. The combined outfit can be turned in a radius of ten feet and the tank section when empty only weights 950 pounds. It is claimed in sections where it has been demonstrated that the new apparatus has developed a high degree of efficiency and a very material reduction in the cost of spraying. One of its features is that the driver of the tractor can throw the pumps in and out of gear without leaving his seat.

Fire, believed to be incendiary, completely destroyed the storage and packing warehouse of the Entiat Growers' league at Entiat, Wash. The building was a wooden structure 200 by 288 feet in size, built four years ago and owned by the Cooperative Association of Growers connected with Skookum Packers' association. The loss to the building is $25,000,

and to the contents, $50,000, fully covered by insurance.

The Yakima Valley Fruit Grower's Association has announced the closing of its 1919 Winesap pool. According to the records, 200,223 boxes were shipped bringing a net return of $2.06 per box to members.

Frost proof apple warehouses at Grant Orchards, the Soap Lake station of the Great Northern Railway, 120 miles west of Spokane, and at Dalton, 40 miles east of this city, are announced by Charles J. Webb of the Spokane Fruit Growers' Company. Each will be 100x50 feet, with the second story for packing purposes and a receiving shed, fifty by fifty feet at one end. The storage capacity will be 35,000 boxes of apples, or forty carloads.

At Meyers Falls, residents have decided to erect a frost-proof warehouse fifty by one hundred feet.

Yakima cherry growers are now beginning to check upon the the season's profits and find that, though the crop was light, higher prices more than made up for lack of quantity. Many growers made over $1,000 an acre.

W. W. Scott, of Lower Naches, got $3,000 gross for cherries from about 200 trees, which were planted on less than two acres; John Hamberg got $1365 an acre from two acres of Bings. He reports the record of 17 cents a pound for his fruit. Lee Booth, Nob Hill, from four acres of comparatively young trees $1,385.

The first apple shipment from the lower Yakima Valley was made by the Grandview Fruit & Storage Company. The apples were grown by S. C. Loop.

The Spokane Valley Growers' union will begin work at once on a $50,000 addition which will double the capacity of the plant at Opportunity and make it possible to handle 300,000 boxes of apples in 60 days this fall, according to Edward Pierce, manager.

Spokane business men and others connected with the cider making industry there are being interested in the establishment of a plant near the city for manufacturing apple cider by a new vacuum process of condensing recently patented and put in operation. The process is said to be a big advance over the methods heretofore used in this industry. O. H. Feilberg of the Spokane Cider Company, is chiefly interested in the new project and states that the company, when formed, will build a plant to cost $25,000 for the building and machinery. A dryer for the pomace will be installed in the plant and the by-product sold for cattle feed and the peels and cores for jelly-making.

A fruit warehouse, costing $50,000, will be erected at Fairfield, Wash., by the Palouse Fruit Growers' corporation, according to J. R. Wilson, treasurer and manager.

From reports of individual growers it is thought that unless something unforeseen happens at least 300,000 boxes will be harvested in the Deer Park orchard section northwest of Spokane. Evidence is clear, it is stated, that smudging saved the crop. While there are a few isolated instances of a fair crop in the unsmudged areas, there will be nothing like a full yield. In the sections where the smoke screen was resorted to the trees are loaded with fruit.

IDAHO.

Ninety per cent of the cherry crop in the Emmett section is signed up in the Emmett Cherry Growers' association, which was organized this season under the auspices of the Gem county farm bureau.

Yields from two Ada County fields treated with sulphur and land plaster have been measured and a substantial increase in crops was reported. A field treated with land plaster showed a yield of 10.69 tons of green hay, while a similar field, untreated, yielded only 6.76 tons. Treatment with sulphur resulted in a yield of 10.37 tons, as compared with 8.36 on untreated land.

Several residents of the Lewiston Orchards community in Nez Perce County have used humus-making crops this season. The best of these is that of T. B. Gano, which consists of 10 acres of Bengalia field peas sowed at the rate of about 100 pounds to the acre. It is expected that a considerable acreage of hairy vetch will be sown this fall for a cover crop.

The Idaho prune crop is reported to give promise of being the largest in the history of the state.

What They Are Doing in California

The prices fixed for canning pears by the California Pear Growers' Association for this year are $100 per ton for first grade and $85 per ton for second grade fruit. These prices are $15 per ton higher than those of last year. A short crop generally throughout the Coast region is given as the cause for the increase in prices.

Although plums, apricots and prunes were hurt in some localities in California by recent hot weather the damage to these crops as a whole is said to have been slight. Raisin and table grapes were more seriously affected.

A car of early peaches and plums was recently sold in the East for $4,107 gross. This is said to be the highest price ever paid for these varieties of fruits to California growers.

The Sunsweet Standard, the official organ of the' California Prune & Apricot Growers Association says that an opinion was reached recently at a meeting of the board of directors that a fair price for drying prunes will be $12 per green ton and for apricots $21 per green ton, together with the pits. These prices are made to establish a basis for those who dry these fruits for others.

On account of the fact that oranges in some sections of California are dropping heavily it is announced that it will be several weeks before an accurate forecast of the new crop can be given. The drop has continued later than usual and is spotted, being much heavier in some districts than others.

The Southern Pacific is urging California fruit shippers to load cars to the maximum. The company states that the cars will stand a considerably heavier load than is now being placed in them although the tonnage has been increased by more than two tons per car. By this action and greater promptness in loading and unloading it is hoped to give shippers a much better service.

Apricot growers who are members of the California Prune and Apricot Growers' Inc., the statewide cooperative selling association which claims to market 75 per cent of the prunes and apricots produced in California, will be paid from 18 cents to 33 cents a pound for their 1920 crop of dried apricots, according to prices recently named by the board of directors of the association. Though the tremendous export demand, which so strongly influenced last year's high prices has completely collapsed, according to H. G. Coykendall, general manager of the association, the association has been able to name a slightly higher average price for this year's dried apricots than last year.

Bits About Fruit, Fruitmen and Fruitgrowing

An apple crop report on the state of Washington, compiled by G. S. Ray of Spokane, agricultural statistician of the bureau of crop estimates, says that dropping from a condition of 85 per cent of normal on June 1 to 70 per cent of normal on July 1, the apple crop of Washington promises to be 15,217,000 bushels, as compared with the June 1 forecast of 17,056,000 bushels and the 1919 production of 19,136,000 bushels.

This year the United States is expected to produce 200,421,000 bushels of apples, based on July 1 conditions, while last year's crop totaled 144,429,000 bushels. The average condition of apples for the entire country dropped from 79.3 per cent of normal on June 1 to 70.7 per cent on July 1.

Fruit growers who have motor trucks or who are intending purchasing will be interested in the announcement that the International Motor Truck has just secured a site for the erection of the largest motor truck plant in the world. The site of the new plant will be located at Fort Wayne, Indiana, and comprises 140 acres of land. The buildings of the new plant, it is stated will embody the improvements of every important modern automobile and motor truck plant in the United States. The company says that in doing this that it plans frankly to take advantage of other people's experience in building for manufacture on a large scale, with the motive in view of manufacturing the best truck in the world.

E. F. Benson, commissioner of the Department of Agriculture for the state of Washington, who recently visited the orchards in New Zealand in a letter to the agricultural bulletin says:

"Thirty-seven thousand acres now in fruit, with only one million people here, means that much will be exported, especially as thousands of acres of new orchards are being planted. Some of the fruit will compete with ours everywhere. I never tasted better Delicious apples than those grown in Hawkes Bay district and we are told that is not the best fruit district in the Dominion. In the Canterbury district we had Comice pears that should top any market in the world. The Winter Cole—much

good, too. The Jonathan apples are most in evidence now. We think the flavor not quite equal to ours but it may well be that from some other district they may fully equal our best. They have all the pests we have and not as cold winters or as hot summers to help fight them, but the best skill is being used in mastering all their horticultural difficulties."

According to English apple exporters who have looked the situation over the market for American apples in Great Britain this year should show considerable improvement. Representatives of several of these firms who have been on the Coast express the opinion that the high prices which are obtained for American fruit in England will result in marketing a greater quantity of better quality fruit there leaving the inferior stuff to be marketed at home.

Fearing an unprecedented car shortage apple growers in the east are reported to be taking steps to market a good deal of their fruit by motor truck lines. In many of these sections where the hauls are comparatively short it is believed that the ship by truck movement will work out very successfully.

Cannery Notes

The Oregon Growers' Cooperative Association recently acquired possession of the cannery and packing plant located at Sutherlin. The plant is a large one and in addition to the cannery is equipped with a prune drying and packing outfit, a juice plant and a lime-sulphur manufacturing plant. The association is also building driers and packing plants at Carlton, Forest Grove, Riddle, Myrtle Creek and Sheridan. At Eugene where the plant of the Eugene Fruit Growers Association is located which is affilitated with the Oregon Growers' Association, the Eugene establishment has been greatly enlarged and is now one of the most complete in the Northwest.

The cannery of the Montesano Packing Company was opened recently for the season. The establishment expects to put up 4,000 cases of beans this year.

A cherry grower living at The Dalles, Oregon is reported to have marketed one motor truck load of cherries at a cannery there this year for which he received $900.

The Silverton Canning Company, of Silverton, Oregon, is ready for operation. The plant of the company is a new one and is equipped to handle all kinds of fruits.

The Hillsboro Canning Company, of Hillsboro, Oregon, which has put its establishment into running condition at a cost of $150,000 now has a plant that covers a space of ground 368 by 80 feet. The plant is equipped to handle a very large tonnage and expects to put up 30,000 cases of fruits this year.

The American Can Company has purchased a large building site in the manufacturing district of Portland, Oregon, and is preparing to erect a $1,500,000 factory in that city. The building will be 89 feet wide by over 400 feet long, three stories high and will be constructed of reinforced concrete. The erection of the plant in Portland is due to the heavy demand for cans for canning purposes that has developed in the Northwest during the past two years.

Two new canneries in Skagit County, Washington, began operating this month. These are the Burlington Cannery Company, at Burlington, and the Skagit Canning Company at Sedro Wooley. A general line of fruits and berries will be canned by both and the cannery at Sedro Wooley expects to utilize both beets and string beans in addition. Both plants have gone to considerable expense to have their equipments modern in every detail. In addition to the above, the W. H. Pride Company, of Bellingham, and the Everett Fruit Products Company, of Everett, Washington, expect to buy considerable fruit in Skagit County and ship to their respective canneries.

That the inspection work recently started by the National Canners Association will be a great thing, not only for the canning industry in Oregon, but also for the housewives, is the opinion of Ernest H. Weigand, of the horticultural products department of the Oregon Agricultural College, who was recently appointed director of the inspection service of the association, in Oregon. A preliminary survey of 10 Oregon canneries has already been made under the direction of Professor Weigand --those of Newberg, McMinnville, Spring Brook, Gresham, Falls City, Lebanon, Junction City, Eugene Fruit Growers' Association, Creswell, and Roseburg. The inspection is entirely voluntary on the part of the canneries which pay a certain fee per case for all cases packed. These canneries agree to live up to the rules and regulations of the inspection service, according to Professor Weigand. Eventually daily inspection will be made, adequate force being employed to handle the work. All fruit received at the plant will be inspected and the entire process of canning observed by the inspectors.

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Professor W. S. Thornber, formerly head of the Department of Horticulture and Landscape Gardening and later director of Extension Service of the State College of Washington, will advise with fruit growers upon all horticultural problems. If your orchard has not been a financial success and you wish to determine its possibilities or you wish to improve your orchard, reduce your losses and increase your returns, I will assist you in working out your problem. Write for terms. W. S. Thornber, Lewiston, Idaho.

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PROFESSOR W. S. THORNBER

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